

## CLAIMS

## WHAT IS CLAIMED IS:

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1. A method for provisioning mobile terminals for use of applications offered by one or more network services on a network, comprising:

interfacing at least one mobile terminal to at least one network service via a provisioning Web service, wherein the provisioning Web service provides a single point of interface to the network service for provisioning the mobile terminal; and

provisioning the mobile terminal by the provisioning Web service for use of at least one application provided by the network service, wherein the provisioning comprises configuring the mobile terminal for use of the application and delivering the application to the mobile terminal.

2. The method as in Claim 1, wherein interfacing the mobile terminal to the network service comprises establishing a network connection between the network service and a Web services endpoint associated with the provisioning Web service which terminates Web services protocols.

3. The method as in Claim 2, further comprising parsing requests from one or more of Web service modules within the provisioning Web service and the network service and generating responses thereto.

4. The method as in Claim 3, wherein parsing requests and generating responses thereto comprises implementing Simple Object Access Protocol (SOAP) for parsing the requests and generating the responses.

5. The method as in Claim 2, further comprising interfacing the Web service endpoint with a service registry to advertise the provisioning Web service.

1           6.     The method as in Claim 5, wherein interfacing the Web service  
2 endpoint with a service registry comprises advertising the provisioning Web service  
3 via a Universal Description, Discovery, and Integration (UDDI) protocol and a Web  
4 Services Description Language (WSDL) definition language.

1           7.     The method as in Claim 2, further comprising enabling the application  
2 to initiate requests to provision the mobile terminals via the Web service endpoint.

1           8.     The method as in Claim 1, wherein delivering the application to the  
2 mobile terminal comprises delivering the application via a data object delivery  
3 module of the provisioning Web service.

1           9.     The method as in Claim 1, wherein delivering the application to the  
2 mobile terminal comprises comparing data object variants offered by the application  
3 with a terminal type of the mobile terminal to determine a suitable data object to  
4 deliver for the terminal type of the mobile terminal.

1           10.    The method as in Claim 9, further comprising:  
2                   receiving the terminal type of the mobile terminal at a presence  
3 module associated with the provisioning Web service; and  
4                   providing the terminal type of the mobile terminal from the presence  
5 module to a delivery module associated with the provisioning Web service.

1           11.    The method as in Claim 9, further comprising delivering the suitable  
2 data object to the mobile terminal, wherein the suitable data object comprises  
3 information to allow the mobile terminal access to the application provided by the  
4 network service.

1           12.    The method as in Claim 11, wherein delivering the suitable data object  
2 to the mobile terminal comprises delivering the suitable data object via a push  
3 channel.

1           13.    The method as in Claim 11, wherein delivering the suitable data object  
2 to the mobile terminal comprises providing an address of the suitable data object to  
3 the mobile terminal for downloading, wherein the address identifies a storage  
4 location of the suitable data object at a delivery module associated with the Web  
5 service, and wherein the address is delivered to the mobile terminal via a notification  
6 module associated with the provisioning Web service.

1           14.    The method as in Claim 1, wherein configuring the mobile terminal for  
2 use of the application comprises sending the appropriate configuration settings to  
3 the mobile terminal.

1           15.    The method as in Claim 14, wherein sending the appropriate  
2 configuration settings to the mobile terminal comprises sending the configuration  
3 settings to the mobile terminal via a terminal management server.

1           16.    The method as in Claim 1, wherein configuring the mobile terminal for  
2 use of the application comprises remotely configuring parameters in the mobile  
3 terminal to prepare the mobile terminal for proper access and use of the application.

1           17.    The method as in Claim 16, wherein remotely configuring parameters  
2 in the mobile terminal comprises remotely configuring data object parameters  
3 associated with data objects of the application in the mobile terminal.

1           18.    The method as in Claim 16, wherein remotely configuring parameters  
2 in the mobile terminal comprises remotely configuring connectivity parameters in the  
3 mobile terminal to enable proper connection of the mobile terminal to the network  
4 service.

1           19.    The method as in Claim 1, wherein the network service is an  
2 application available via the Internet.

1           20.    The method as in Claim 1, wherein the network service is an  
2 application available via an intranet.

1           21.    A system for provisioning mobile terminals for use of applications  
2 provided by network service providers on a network, comprising:

3                   a Web service interface coupled between the mobile terminals to be  
4 provisioned and the network service providers to control respective provisioning  
5 procedures, wherein the Web service interface serves as a single interface to the  
6 network service providers providing the applications;

7                   a Web service mobile terminal configuration module coupled to the  
8 Web service interface to configure the mobile terminals for use of the applications  
9 as part of the provisioning procedures; and

10                  a Web service data object delivery module coupled to the Web service  
11 interface to deliver the applications to successfully configured mobile terminals as  
12 part of the provisioning procedures.

1           22.    The system as in Claim 21, wherein the Web service interface, the  
2 Web service mobile terminal configuration module, and the Web service data object  
3 delivery module are implemented as a single Web service.

1           23.    The system as in Claim 21, wherein the Web service interface, the  
2 Web service mobile terminal configuration module, and the Web service data object  
3 delivery module are implemented as a set of two or more cooperating Web services.

1           24.    A system for provisioning mobile terminals operable on a network,  
2 comprising:  
3                   at least one mobile terminal coupled to the network;  
4                   a network service coupled to the network to provide an application via  
5 the network;  
6                   a provisioning Web service coupled to the mobile terminal and the  
7 network service to control provisioning of the terminal via a single interface to the

8 network service, and to effect the provisioning by configuring application use  
9 settings on the mobile terminal and delivering the application to the mobile terminal.

1 25. The system as in Claim 24, wherein the provisioning Web service  
2 comprises a service logic module comprising a Web service endpoint to terminate  
3 Web service protocols.

1 26. The system as in Claim 25, wherein the service logic module further  
2 comprises a sequence management module to communicate with a plurality of  
3 provisioning modules associated with the Web service in an appropriate sequence  
4 to properly provision the mobile terminal.

1 27. The system as in Claim 24, wherein the provisioning Web service  
2 comprises a data object delivery module to deliver the application to the mobile  
3 terminal upon successful configuration of the application use settings on the mobile  
4 terminal.

1 28. The system as in Claim 27, wherein the data object delivery module  
2 comprises a compare module to compare a terminal type of the mobile terminal to  
3 one or more data object variants offered by the application, and to output the data  
4 object variant corresponding to the terminal type for delivery to the mobile terminal.

1 29. The system as in Claim 28, further comprising a push module to  
2 deliver the output data object variant via a push channel.

1 30. The system as in Claim 28, further comprising a notification module to  
2 provide an address of the output data object variant to the mobile terminal from  
3 which the mobile terminal can access to obtain delivery of the output data object  
4 variant.

1           31.    The system as in Claim 27, wherein the data object delivery module  
2 comprises a cache for storing the application for subsequent delivery to the mobile  
3 terminal.

1           32.    The system as in Claim 27, wherein the provisioning Web service  
2 further comprises a notification module coupled to the data object delivery module to  
3 notify the mobile terminal that the application is available at the data object deliver  
4 module, if the mobile terminal is not capable of direct delivery receipt by the data  
5 object delivery module, and to provide an address of the application at the data  
6 object delivery module.

1           33.    The system as in Claim 24, wherein the provisioning Web service  
2 comprises a terminal management module to configure the application use settings  
3 on the mobile terminal to allow connectivity of the mobile terminal to the network  
4 service.

1           34.    The system as in Claim 24, wherein the provisioning Web service  
2 comprises a plurality of cooperative provisioning modules to carry out the  
3 provisioning of the terminal.

1           35.    The system as in Claim 34, wherein the provisioning Web service  
2 comprises a presence module configured to receive terminal information of the  
3 mobile terminal that is being provisioned, and to supply the terminal information to  
4 one or more of the cooperative provisioning modules during the provisioning of the  
5 terminal.

1           36.    The system as in Claim 24, wherein the provisioning Web service  
2 comprises:

- 3           (a)    a service logic module comprising:  
4                (i)     a Web service endpoint to terminate Web service protocols;  
5                (ii)    a sequence management module to control a sequence of  
6 provisioning operations;

7 (b) a data object delivery module to deliver the application to the mobile  
8 terminal upon successful configuration of the application use settings on the mobile  
9 terminal;

10 (c) a notification module coupled to the data object delivery module to  
11 notify the mobile terminal that the application is available at the data object deliver  
12 module, if the mobile terminal is not capable of direct delivery receipt by the data  
13 object delivery module, and to provide an address of the application at the data  
14 object delivery module;

15 (d) a terminal management module to configure the application use  
16 settings on the mobile terminal to allow connectivity of the mobile terminal to the  
17 network service; and

18 (e) a presence module configured to receive terminal information of the  
19 mobile terminal that is being provisioned, and to supply the terminal information to  
20 one or more of the data object delivery module, the notification module, and the  
21 terminal management module during the provisioning of the terminal.

1 37. A suite of Web services to provision a terminal for use of an  
2 application on a network, comprising:

3 a client provisioning Web service to interface at least one mobile  
4 terminal to at least one network service, wherein the client provisioning Web service  
5 provides a single point of interface to the network service for provisioning the mobile  
6 terminal for use of the application provided by the network service;

7 a terminal management Web service to configure application use  
8 settings on the mobile terminal to enable use of the application;

9 a presence Web service connected via the network to the mobile  
10 terminal to receive at least a terminal type of the mobile terminal;

11 a delivery Web service coupled to the presence Web service to  
12 receive the terminal type from the presence Web service, and to identify a data  
13 object for delivery corresponding to the terminal type upon successful configuration  
14 of the application use settings on the mobile terminal; and

15 a notification Web service coupled to the delivery Web service to  
16 deliver the data object to the mobile terminal if the terminal type indicates that the  
17 mobile terminal is capable of receiving the data object via a push operation, and to  
18 deliver to the mobile terminal an address of the data object stored at the delivery  
19 Web service if the terminal type indicates that the mobile terminal is not capable of  
20 receiving the data object via a push operation.

1 38. A system for provisioning mobile terminals for use of applications  
2 offered by one or more network services on a network, comprising:  
3 means for interfacing at least one mobile terminal to at least one  
4 network service via a provisioning Web service, wherein the provisioning Web  
5 service provides a single point of interface to the network service for provisioning the  
6 mobile terminal; and  
7 means for provisioning the mobile terminal by the provisioning Web  
8 service for use of at least one application provided by the network service, wherein  
9 the means for provisioning comprises means for configuring the mobile terminal for  
10 use of the application and means for delivering the application to the mobile  
11 terminal.

12 39. A computer-readable medium having computer-executable instructions  
13 for provisioning mobile terminals for use of applications offered by one or more  
14 network services on a network, the computer-executable instructions performing  
15 steps comprising:

16 interfacing at least one mobile terminal to at least one network service  
17 via a provisioning Web service, wherein the provisioning Web service provides a  
18 single point of interface to the network service for provisioning the mobile terminal;  
19 and

20 provisioning the mobile terminal by the provisioning Web service for  
21 use of at least one application provided by the network service, wherein the  
22 provisioning comprises configuring the mobile terminal for use of the application and  
23 delivering the application to the mobile terminal.